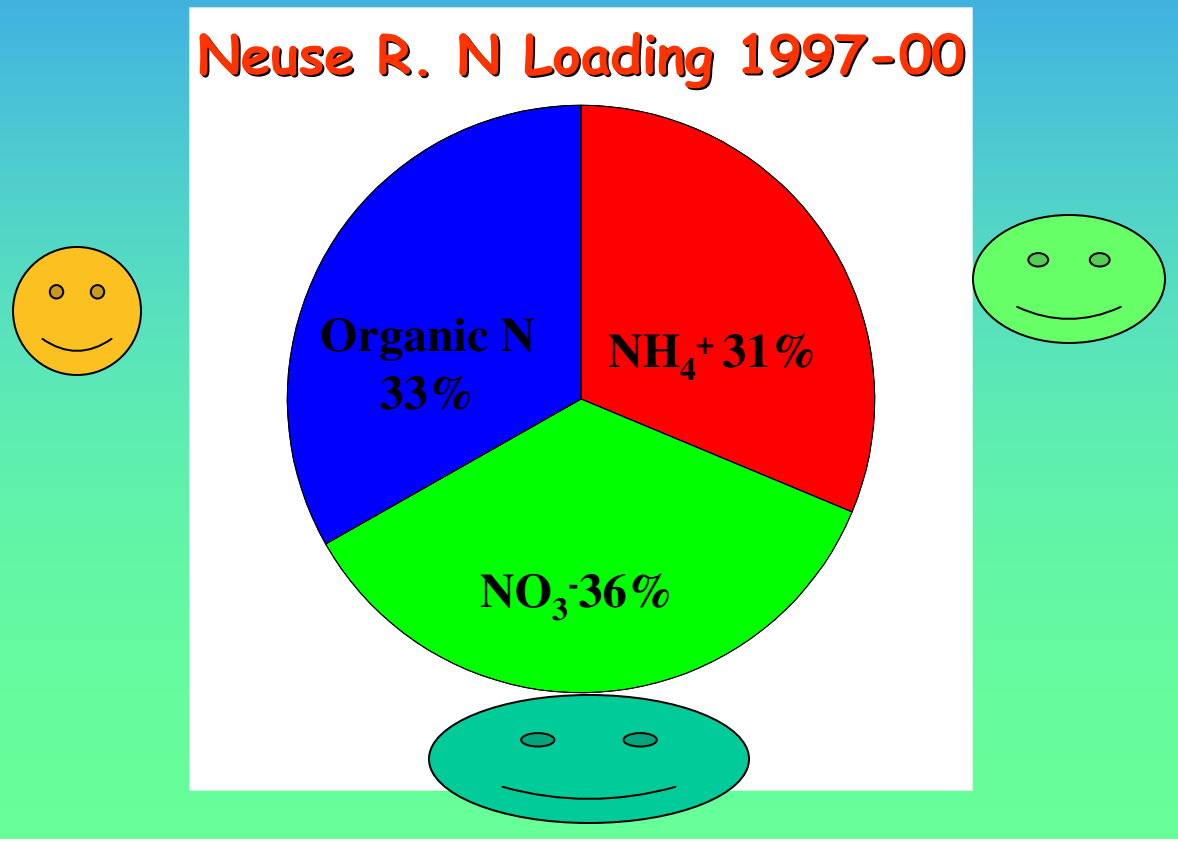
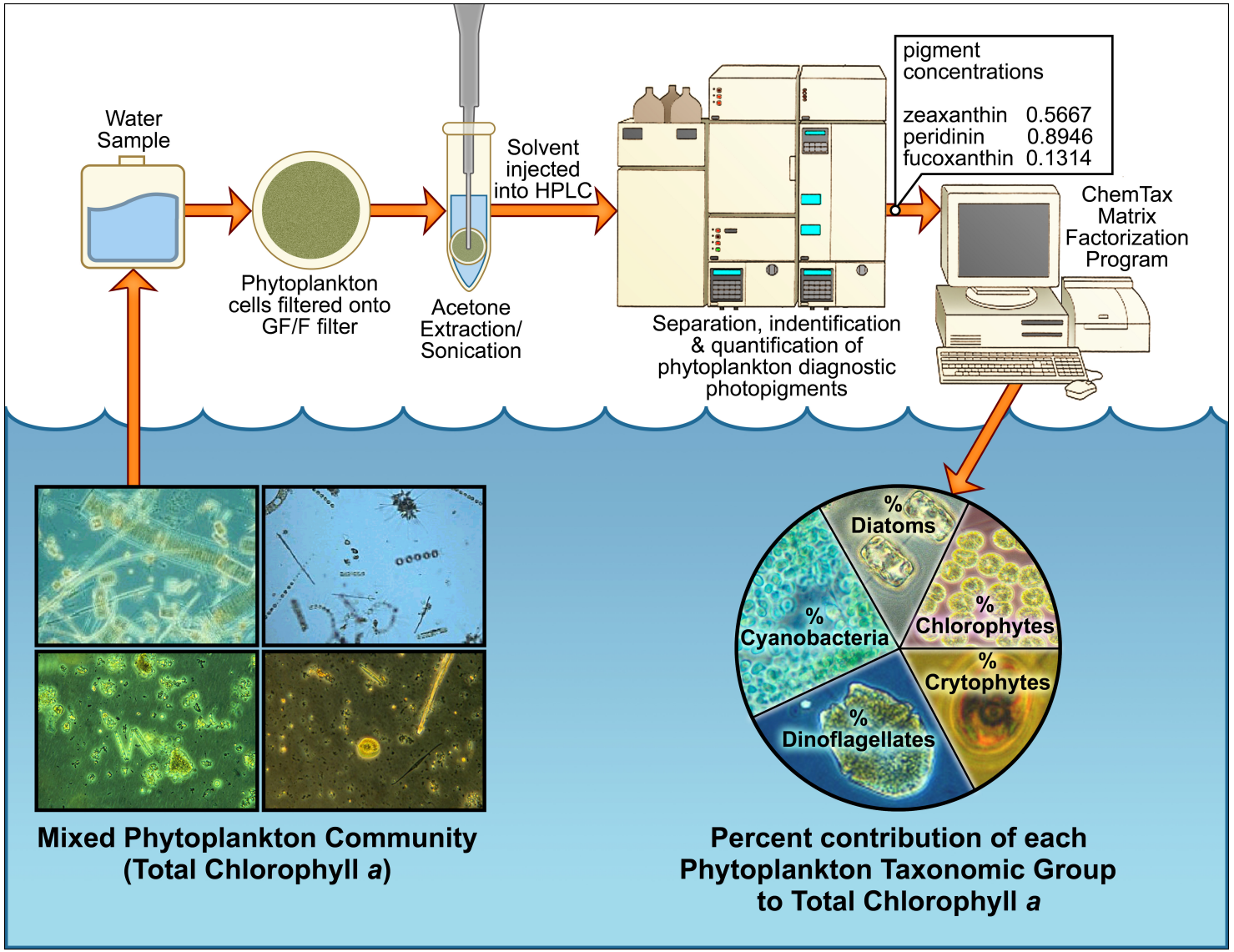
However, when considering N reductions…….
"New" N comes in different "flavors"

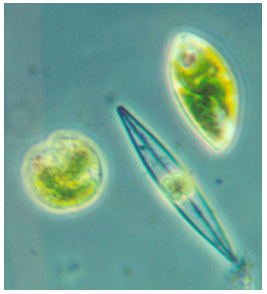
Why care?? Ecological impacts of specific forms of N enrichment?



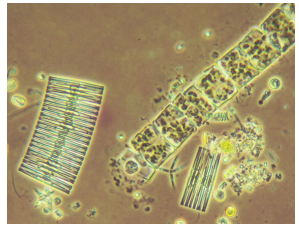
Looking into the "green box": Algal taxonomic group responses to nutrient and hydrologic perturbations by HPLC-ChemTax Analysis



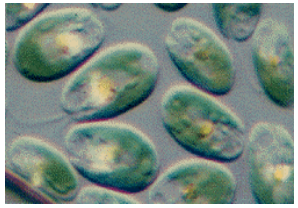
Bogue Sound Bioassay August, 1996



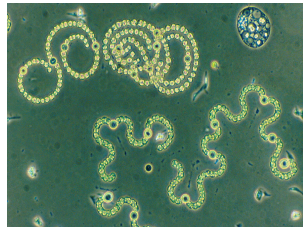
All phytos



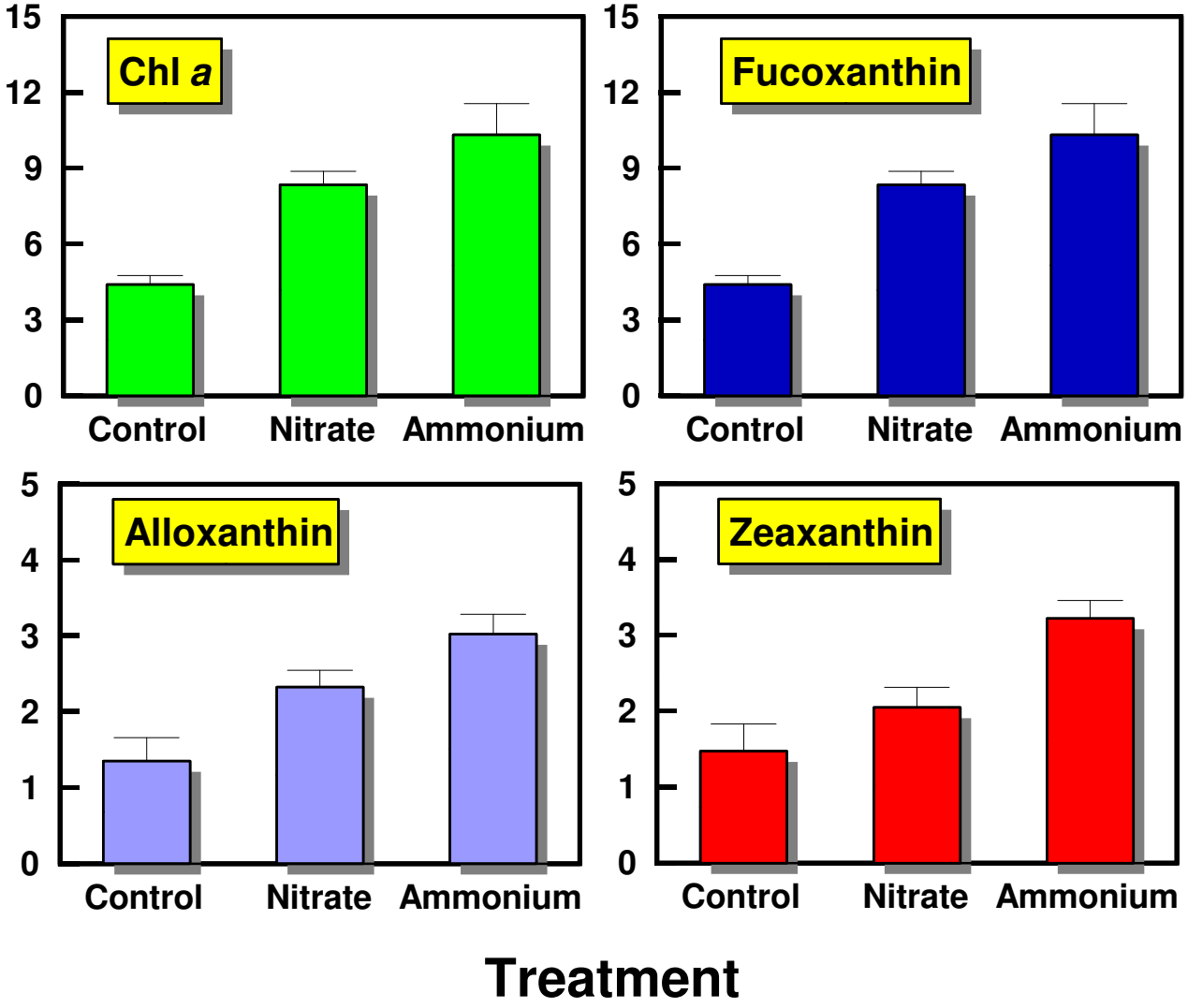
diatoms



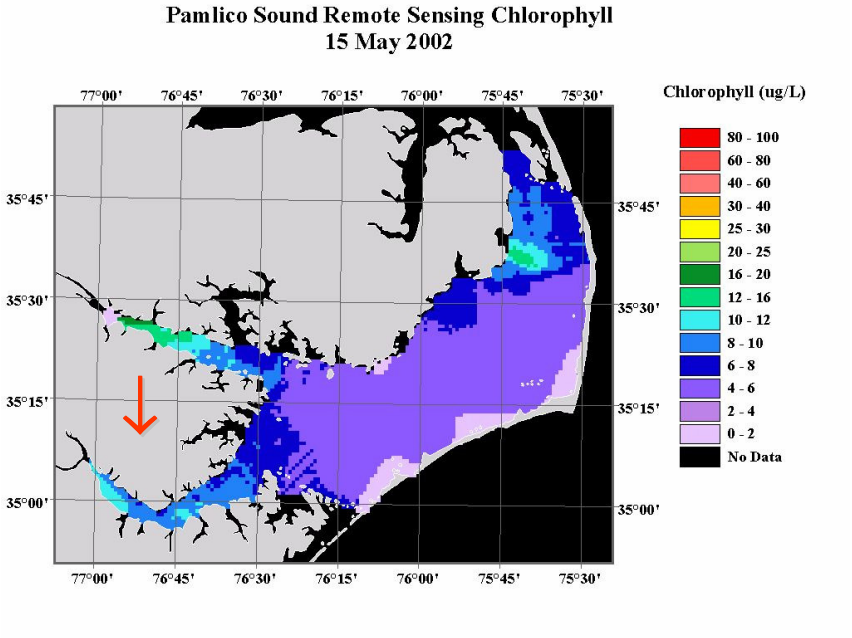
cryptophytes

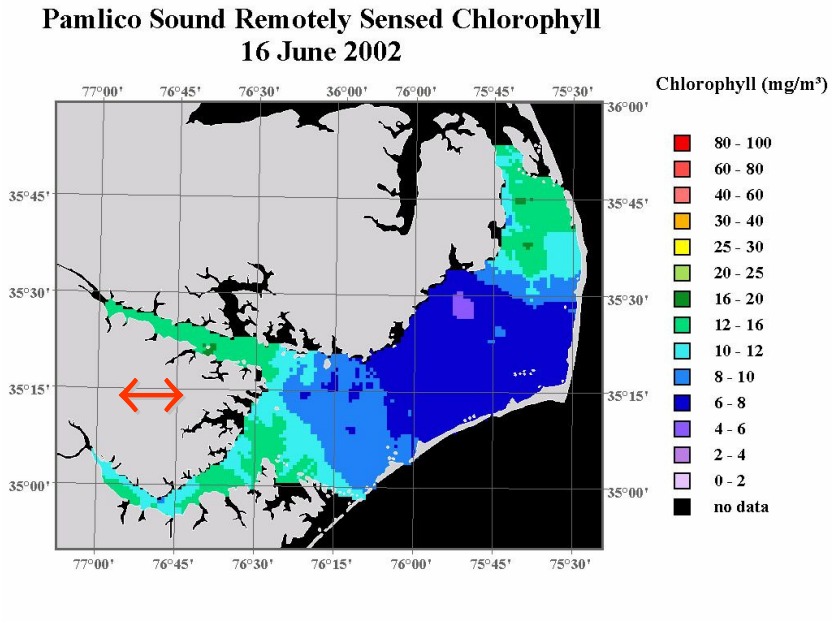


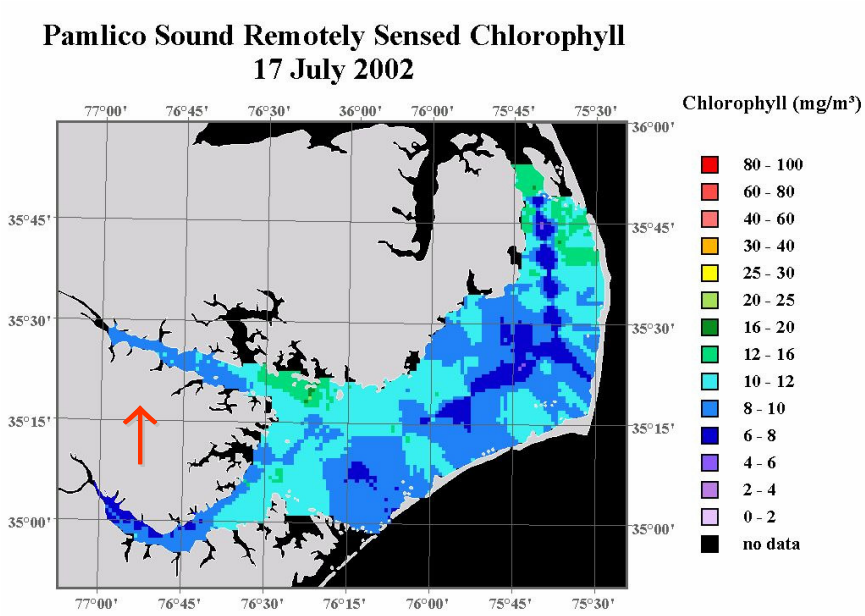
cyanobacteria

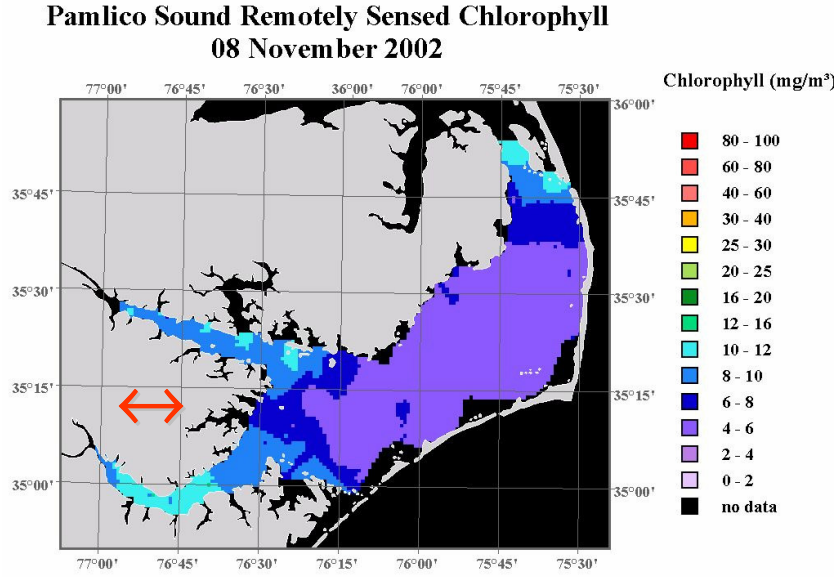


Hydrology matters too: impacts on algal production (Chl *a*) in Pamlico Sound



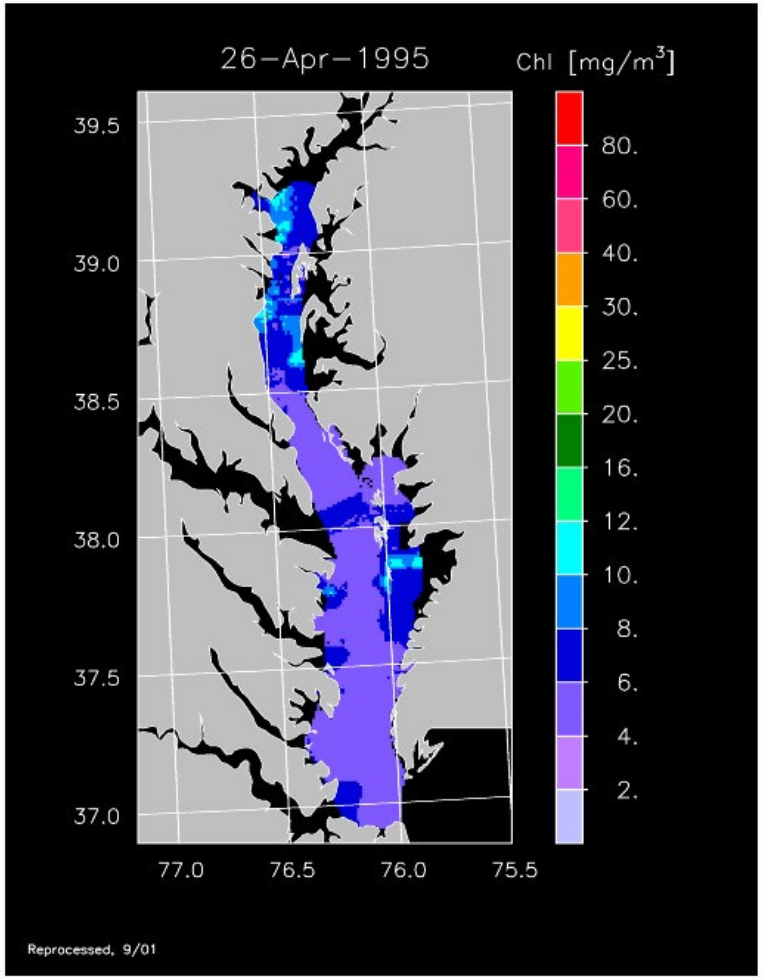




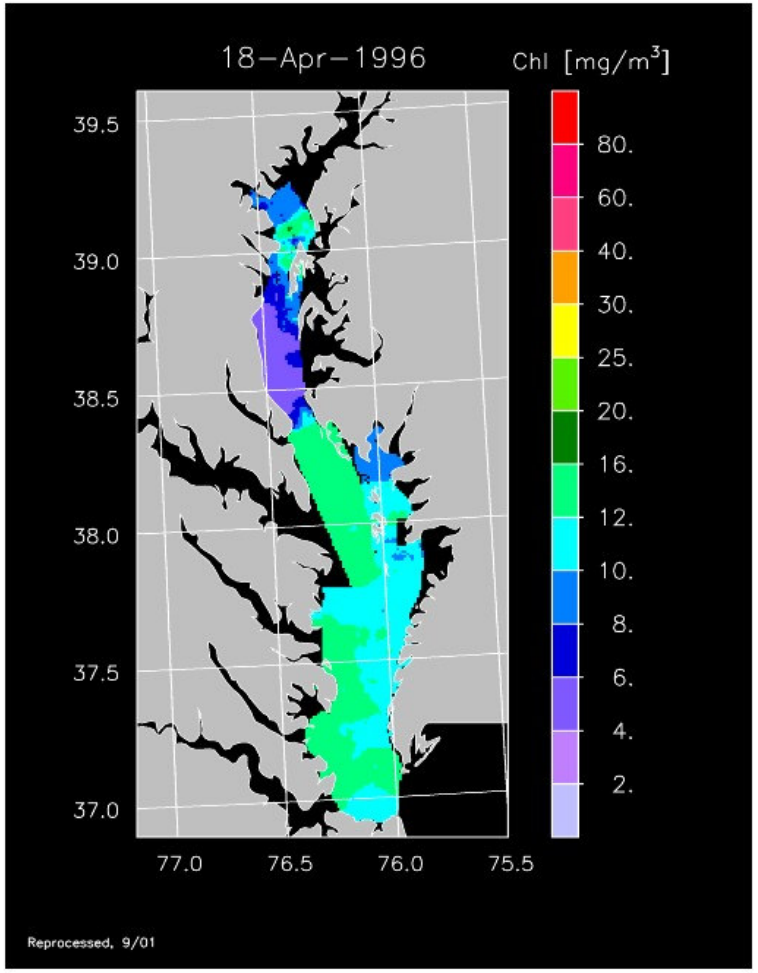


Flow: high↑, low↓, moderate↔

Chesapeake Bay: Remotely sensed chl-a from SeaWiFS Aircraft Simulator (SAS II) during low flow (’95) and high flow (’96) years



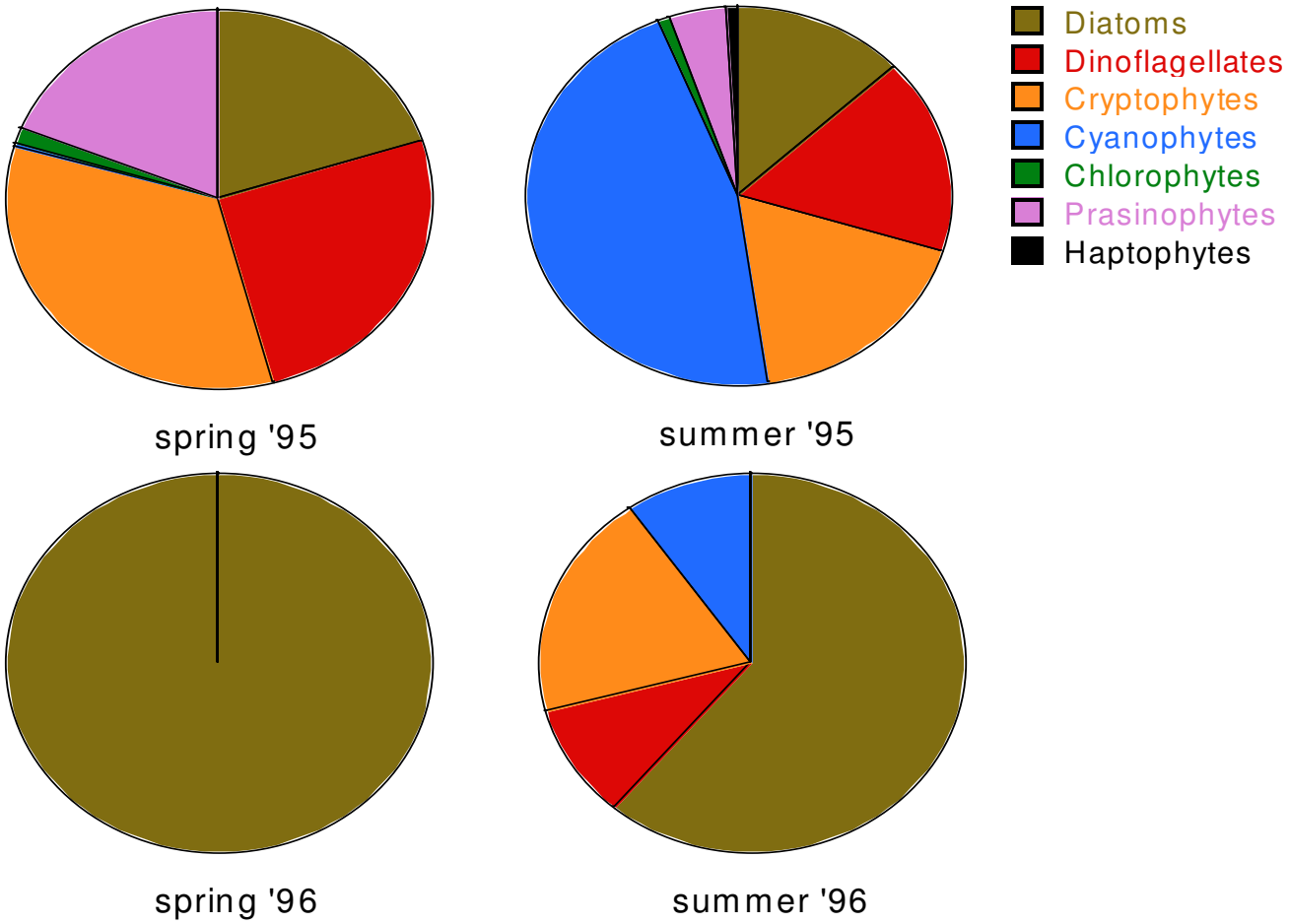
spring ‘95



spring ‘96

Harding et al. 2006

Chesapeake Bay CHEMTAX – contrasting flow years

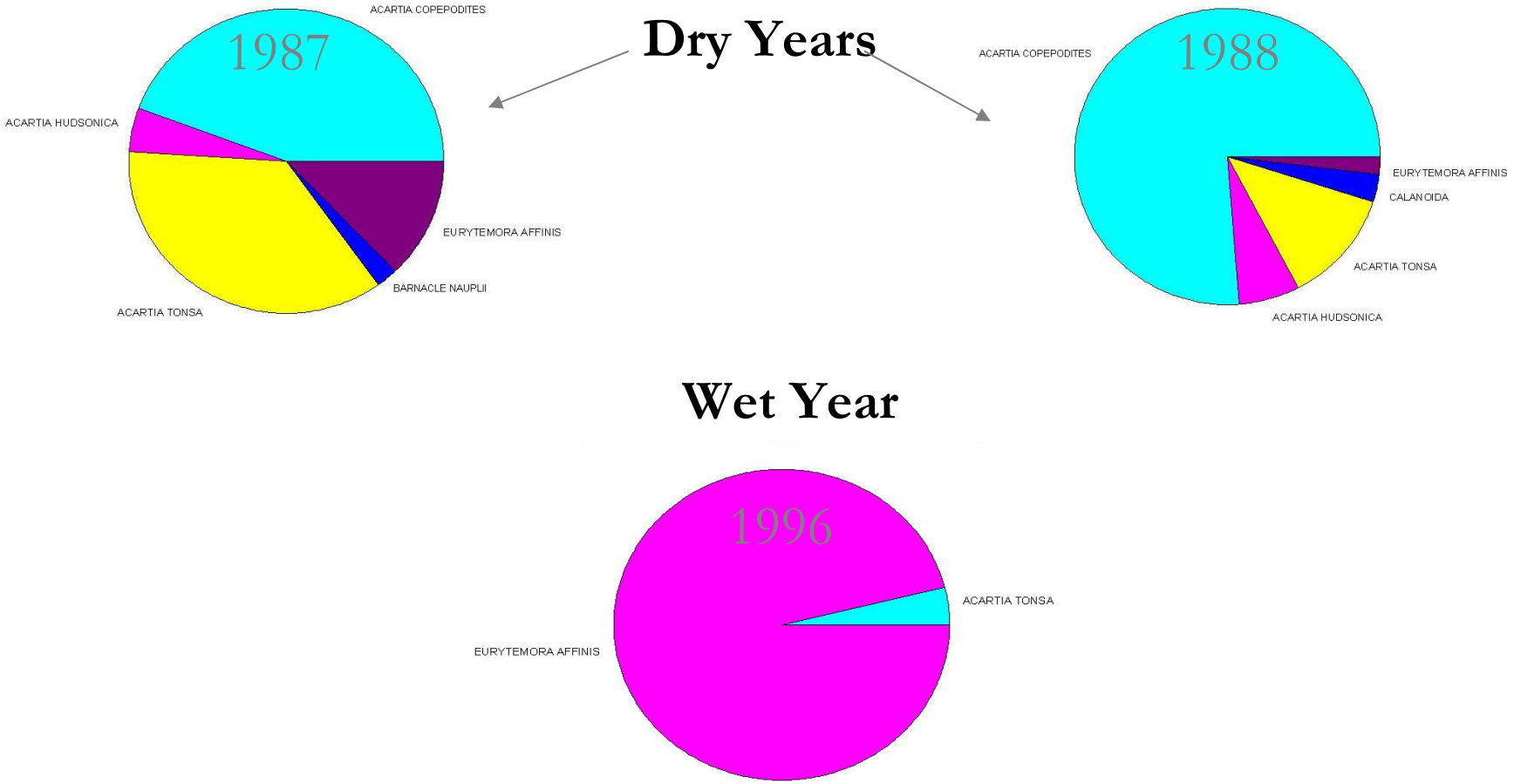


Harding et al. 2006; Adolf et al. 2006

Zooplankton and Climatology

Zooplankton community responses to climatic (hydrologic) variability in CB

Abundances of dominant zooplankton linked to flow and synoptic climatology



Kimmel et al. 2006

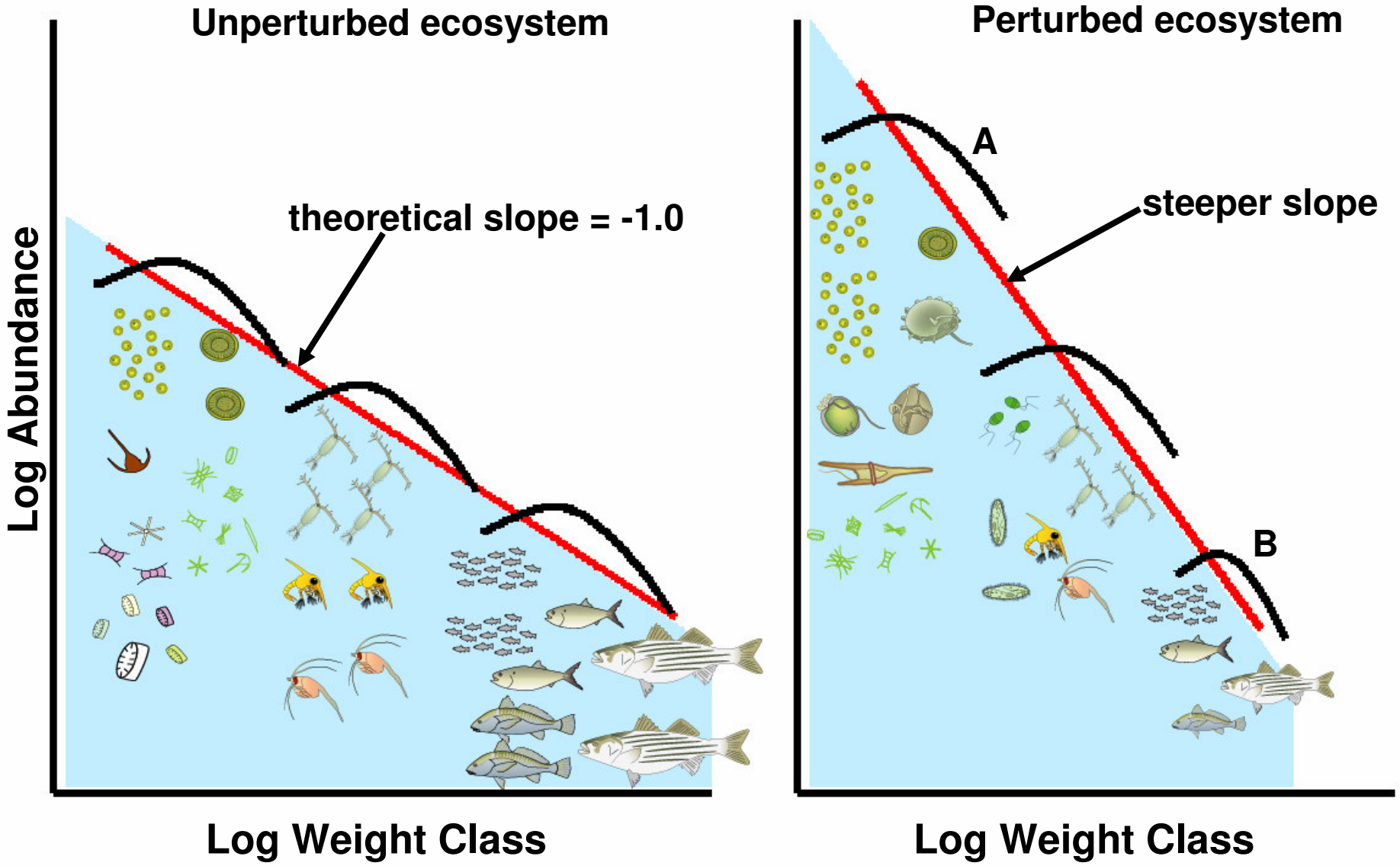
Biomass Size Spectra as Indicators

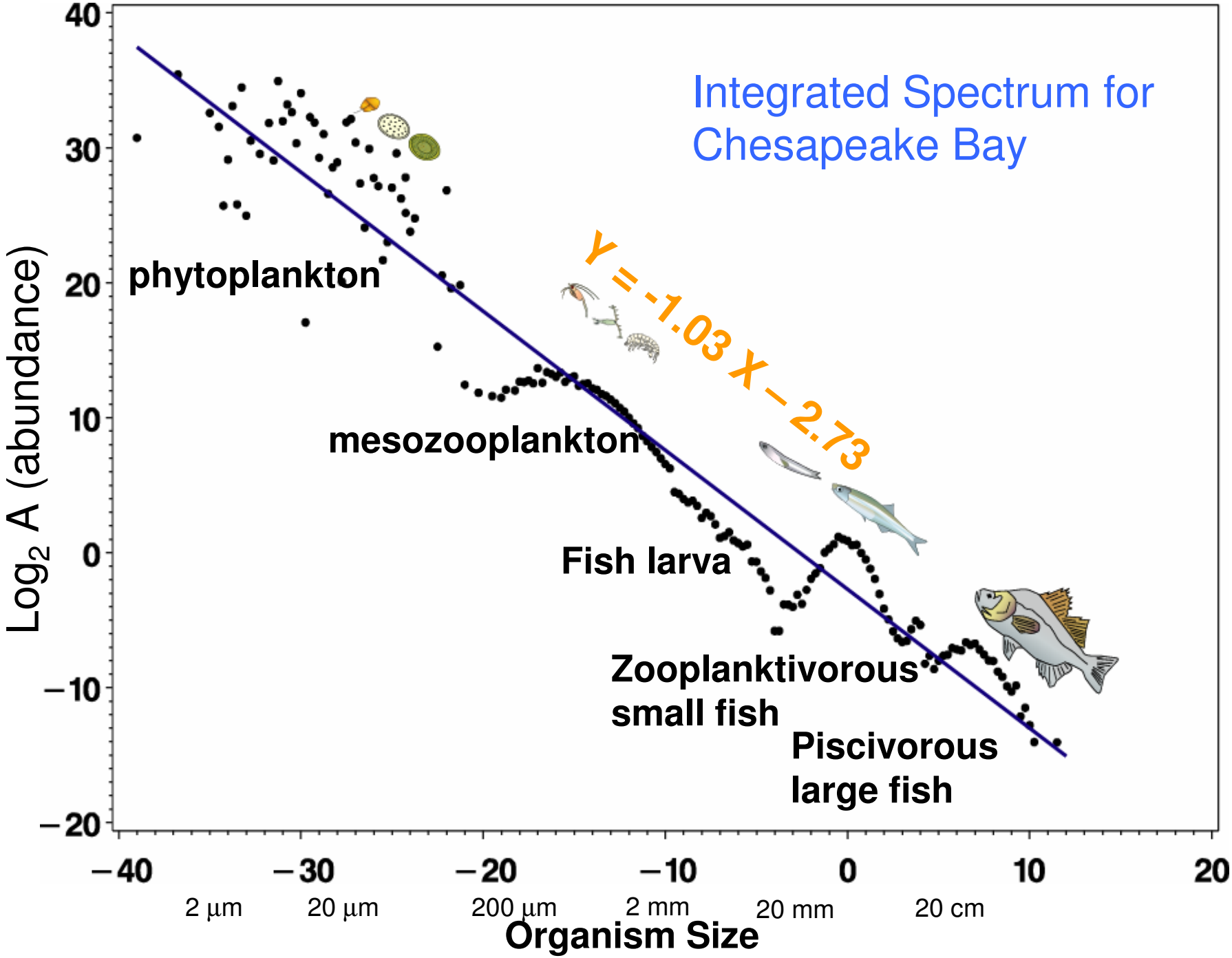
Size Spectra: Integrative Indicators
Across Trophic Levels

Slopes of Spectra and Biomasses at Each Trophic Level are Indicators of Trophic State and Response to Stress

Application: Chesapeake Bay

Biomass Size Spectra as Indicators of Ecosystem Status




Integrated Spectrum for
Chesapeake Bay
Y = -1.03 X – 2.73
phytoplankton
mesozooplankton
Fish larva
Zooplanktivorous
small fish
Piscivorous
large fish
Log2 A (abundance)
40
30
20
10
0
–10
–20
–40
–30
–20
–10
0
10
20
2 µm
20 µm
200 µm
2 mm
20 mm
20 cm
Organism Size